

## Формулы приведения.

Упростите выражения, пользуясь формулами приведения:

132. 1)  $\cos(90^\circ + \alpha)$ ;                      2)  $\sin(180^\circ - \alpha)$ ;                      3)  $\operatorname{tg}(360^\circ - \alpha)$ ;  
4)  $\operatorname{ctg}(270^\circ + \alpha)$ ;                      5)  $\sin(\pi + \alpha)$ ;                      6)  $\cos\left(\frac{3\pi}{2} - \alpha\right)$ ;  
7)  $\operatorname{tg}\left(\frac{\pi}{2} - \alpha\right)$ ;                      8)  $\operatorname{ctg}(\pi - \alpha)$ ;                      9)  $\operatorname{tg}\left(\alpha - \frac{3\pi}{2}\right)$ ;  
10)  $\operatorname{ctg}(\alpha - 2\pi)$ ;                      11)  $\sin\left(\alpha + \frac{3\pi}{2}\right)$ ;                      12)  $\cos(\alpha + \pi)$ ;  
13)  $\operatorname{ctg}^2\left(\alpha - \frac{\pi}{2}\right)$ ;                      14)  $\operatorname{tg}^2(\alpha - \pi)$ ;                      15)  $\cos^2\left(\alpha + \frac{3\pi}{2}\right)$ ;  
16)  $\sin^2\left(\alpha - \frac{3\pi}{2}\right)$ .

133.  $\sin(90^\circ - \alpha) - \cos(180^\circ - \alpha) - \operatorname{tg}(360^\circ + \alpha) - \operatorname{ctg}(270^\circ + \alpha)$ ;  
134.  $\operatorname{tg}(360^\circ - \alpha) + \operatorname{ctg}(270^\circ - \alpha) + \operatorname{tg}(180^\circ - \alpha) + \operatorname{ctg}(90^\circ - \alpha)$ ;  
135.  $\sin(\alpha - 90^\circ) - \cos(\alpha + 180^\circ) - \operatorname{tg}(\alpha - 270^\circ) - \operatorname{ctg}(\alpha - 360^\circ) - \cos(\alpha - 270^\circ)$ ;  
136.  $\operatorname{tg}^2(\alpha - 180^\circ) \cdot \operatorname{ctg}(\alpha - 360^\circ) + \sin^2(\alpha + 180^\circ) + \sin^2(\alpha - 270^\circ) + \operatorname{ctg}(90^\circ + \alpha)$ ;  
137.  $\sin\left(\alpha - \frac{3\pi}{2}\right) \cdot \sin\left(\alpha + \frac{\pi}{2}\right) + \sin(\alpha - \pi) \cdot \sin(\alpha + \pi) - \cos^2(\alpha + \pi)$ ;  
138.  $\sin^2\left(\alpha + \frac{\pi}{2}\right) - \cos^2(\alpha + \pi) + \sin^2\left(\alpha + \frac{3\pi}{2}\right) + \sin^2(\alpha - 2\pi)$ ;  
139.  $\sin^3(\pi - \alpha) + \sin^3\left(\alpha - \frac{3\pi}{2}\right) + \cos^3(\alpha - \pi) - \cos^3\left(\alpha + \frac{3\pi}{2}\right)$ .

Вычислите по формулам приведения:

140. 1)  $\sin 120^\circ$ ;    2)  $\cos 150^\circ$ ;    3)  $\operatorname{tg} 135^\circ$ ;    4)  $\operatorname{ctg} 300^\circ$ ;    5)  $\sin(-135^\circ)$ ;  
6)  $\cos(-240^\circ)$ .  
141.  $\sin(-300^\circ) + \cos(-225^\circ) + \operatorname{tg}(-330^\circ) + \operatorname{ctg}(-240^\circ)$ .  
142.  $\sin^2(-330^\circ) - \cos^2(-120^\circ) - \operatorname{tg}^2(-240^\circ) + \operatorname{ctg}^2(-150^\circ)$ .  
143.  $m^2 \cdot \operatorname{tg}\left(-\frac{5}{4}\pi\right) - 4mn \cdot \sin\left(-\frac{7}{6}\pi\right) - 3n^2 \cdot \operatorname{tg}^2\left(-\frac{13}{6}\pi\right)$ .

Докажите тождества:

144. 
$$\frac{\sin(360^\circ - \alpha) \cdot \operatorname{tg}(90^\circ + \alpha) \cdot \operatorname{ctg}(270^\circ - \alpha)}{\cos(360^\circ + \alpha) \cdot \operatorname{tg}(180^\circ + \alpha)} = 1.$$

$$145. \frac{\operatorname{ctg}\left(\alpha - \frac{\pi}{2}\right) \cdot \left[\sin\left(\alpha - \frac{3}{2}\pi\right) - \sin(\pi + \alpha)\right]}{\operatorname{tg}(\pi + \alpha) \cdot [\cos(\alpha + 2\pi) + \sin(\alpha - 2\pi)]} = -1.$$

$$146. \frac{\operatorname{tg}\left(\frac{\pi}{2} + \alpha\right) \cdot \cos\left(\frac{3}{2}\pi + \alpha\right) \cdot \cos(-\alpha)}{\operatorname{ctg}(\pi - \alpha) \cdot \sin\left(\frac{3}{2}\pi + \alpha\right)} = -\sin \alpha.$$

$$147. \frac{\sin^2(\alpha - 180^\circ) - \cos^3(270^\circ - \alpha) \cdot \sin(180^\circ + \alpha)}{\operatorname{tg}^2(90^\circ - \alpha) \cdot \cos^2(\alpha - 270^\circ) \cdot \sin^2(\alpha - 90^\circ)} = \operatorname{tg}^2 \alpha.$$

$$148. \frac{\sin\left(\frac{\pi}{2} - \alpha\right) \cdot \operatorname{tg}(\pi - \alpha) - \operatorname{ctg}(\alpha - \pi) \cdot \sin(\alpha - 2\pi)}{\cos(\alpha + \pi) \cdot \cos(\alpha - \pi) + \sin(\pi + \alpha) \cdot \sin(2\pi - \alpha)} = -(\sin \alpha + \cos \alpha).$$

$$149. \frac{\cos^2 336^\circ - \cos^2 156^\circ + \operatorname{tg} 100^\circ \cdot \operatorname{tg} 350^\circ}{\operatorname{tg}^2 72^\circ + \operatorname{ctg}^2 162^\circ} = \frac{1}{2} \operatorname{tg}^2 18^\circ.$$

$$150. \frac{\cos 304^\circ \cdot \operatorname{tg} 416^\circ - \operatorname{tg} 214^\circ \cdot \operatorname{tg}(-56^\circ)}{\operatorname{tg} 214^\circ - \cos 326^\circ \cdot \operatorname{ctg}(-56^\circ)} = \operatorname{ctg} 34^\circ.$$

### ОТВЕТЫ

$$104. \frac{\sqrt{6}-\sqrt{2}}{4}; \frac{\sqrt{2}-\sqrt{6}}{4}; \frac{\sqrt{6}-\sqrt{2}}{4}; \frac{1}{2}. \quad 105. \frac{3\sqrt{3}-\sqrt{7}}{8}. \quad 106. \frac{16}{65}.$$

$$107. 1) 1/2; \quad 2) 0.$$

$$108. 1) \frac{1}{2}; \quad 2) \frac{\sqrt{3}}{2}. \quad 109. 1) -\frac{\sqrt{3}}{2}; \quad 2) -\frac{1}{2}. \quad 110. 1) -\frac{\sqrt{3}}{2}; \quad 2) -\frac{\sqrt{2}}{2}. \quad 133. 2\cos \alpha. \quad 134. 0.$$

$$135. \sin \alpha. \quad 136. 1. \quad 137. \sin^2 \alpha. \quad 138. 1. \quad 139. 0. \quad 141. \frac{\sqrt{3}-\sqrt{2}}{2}. \quad 142. 0.$$

$$143. -(m+n)^2.$$